

Abstract

Fuel Cell Hybrid Pump-Ejector Fuel Recycle System

Fuel cell flow fields (7) have their outlets (23) connected through a low pressure blower (19) to a secondary inlet (31) of an ejector (17), the output of the ejector being connected to the inlets (9) of the fuel flow fields. A high pressure source of hydrogen (14) passes through a remote-sense pressure control valve, thereby causing the correct amount of fuel to flow to the primary inlet (30) of the ejector, in dependence upon the load of the fuel cell stack, to cause the pressure at the fuel inlets (9), or alternatively the fuel outlets (23), to be constant. The blower is selected to provide adequate fuel recycle gas in a range of low power fuel cell stack operation which includes the lowest power operation of the fuel cell stack. The ejector draws fuel recycle gas in excess of the blower maximum. A bypass valve (36) permits the ejector to carry less than maximum fuel.